9-12-1984

Test 1537: Ford TW-35 FWD Diesel and Ford 8830 Diesel 16-Speeds

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 1537—FORD TW-35 FWD DIESEL
ALSO FORD 8830 DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1147 rpm)								
171.12 *(127.60)*	2200	10.166 *(38.479)*	0.414 *(0.252)*	16.83 *(3.316)*	198 *(92.4)*	64 *(17.7)*	75 *(24.1)*	29.13 *(98.38)*
Standard Power Take-off Speed (1000 rpm)—One Hour								
162.55 *(121.21)*	1919	9.249 *(35.007)*	0.397 *(0.241)*	17.58 *(3.463)*	192 *(88.7)*	65 *(18.2)*	76 *(24.4)*	29.13 *(98.35)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
154.07 *(114.89)*	2330	9.521 *(36.041)*	0.431 *(0.262)*	16.18 *(3.188)*	197 *(91.7)*	66 *(18.9)*	77 *(24.7)*	....
0.00 *(0.00)*	2455	2.481 *(9.393)*	....	....	175 *(79.4)*	66 *(18.9)*	77 *(25.0)*	....
79.10 *(58.98)*	2392	5.883 *(22.269)*	0.519 *(0.316)*	13.44 *(2.649)*	182 *(83.3)*	67 *(19.2)*	77 *(25.0)*	....
170.93 *(127.46)*	2201	10.171 *(38.499)*	0.415 *(0.252)*	16.81 *(3.311)*	200 *(93.3)*	67 *(19.2)*	78 *(25.6)*	....
40.06 *(29.87)*	2423	4.133 *(15.644)*	0.720 *(0.438)*	9.69 *(1.909)*	182 *(83.3)*	67 *(19.4)*	78 *(25.3)*	....
116.96 *(87.22)*	2358	7.629 *(28.878)*	0.455 *(0.277)*	15.33 *(3.020)*	187 *(86.1)*	67 *(19.4)*	77 *(25.0)*	....
Av 93.52 ***Av (69.74)***	**2360**	**6.636** ***(25.121)***	**0.495** ***(0.301)***	**14.09** ***(2.776)***	**187** ***(86.2)***	**67** ***(19.2)***	**77** ***(25.1)***	**29.09** ***(98.23)***

DRAWBAR PERFORMANCE
(Front Wheel Drive Engaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (5L) Gear											
145.69 *(108.64)*	10041 *(44.66)*	5.44 *(8.76)*	2199	4.96	10.106 *(38.256)*	0.484 *(0.294)*	14.42 *(2.840)*	201 *(93.6)*	60 *(15.3)*	70 *(20.8)*	28.85 *(97.42)*
75% of Pull at Maximum Power—Ten Hours 8th (5L) Gear											
119.30 *(88.96)*	7625 *(33.92)*	5.87 *(9.44)*	2337	3.59	8.698 *(32.927)*	0.509 *(0.309)*	13.71 *(2.702)*	198 *(92.4)*	63 *(17.2)*	75 *(24.1)*	28.65 *(96.76)*
50% of Pull at Maximum Power—Two Hours 8th (5L) Gear											
81.06 *(60.45)*	5048 *(22.45)*	6.02 *(9.69)*	2368	2.33	6.730 *(25.477)*	0.579 *(0.352)*	12.04 *(2.373)*	190 *(87.8)*	66 *(18.9)*	83 *(28.1)*	28.99 *(97.88)*
50% of Pull at Reduced Engine Speed—Two Hours 11th (6L) Gear											
81.05 *(60.44)*	5048 *(22.45)*	6.02 *(9.69)*	1531	2.24	5.605 *(21.217)*	0.482 *(0.293)*	14.46 *(2.849)*	192 *(88.9)*	69 *(20.3)*	91 *(32.5)*	28.95 *(97.76)*
MAXIMUM POWER IN SELECTED GEARS											
131.17 *(97.81)*	18823 *(83.73)*	2.61 *(4.21)*	2294	14.78	3rd (2L) Gear			196 *(91.1)*	57 *(13.9)*	64 *(17.8)*	28.81 *(97.29)*
138.87 *(103.55)*	15400 *(68.50)*	3.38 *(5.44)*	2199	8.55	4th (3L) Gear			199 *(92.5)*	59 *(15.0)*	65 *(18.3)*	29.00 *(97.93)*
138.38 *(103.19)*	14968 *(66.58)*	3.47 *(5.58)*	2199	8.25	5th (2H) Gear			199 *(92.5)*	60 *(15.6)*	66 *(18.9)*	29.00 *(97.93)*
141.60 *(105.59)*	11885 *(52.86)*	4.47 *(7.19)*	2198	6.00	6th (3H) Gear			200 *(93.1)*	60 *(15.6)*	67 *(19.4)*	29.00 *(97.93)*
144.30 *(107.60)*	11638 *(51.77)*	4.65 *(7.48)*	2200	5.92	7th (4L) Gear			199 *(92.5)*	61 *(16.1)*	69 *(20.6)*	29.00 *(97.93)*
147.55 *(110.02)*	10166 *(45.22)*	5.44 *(8.76)*	2199	5.04	8th (5L) Gear			201 *(93.9)*	60 *(15.6)*	70 *(21.1)*	28.85 *(97.42)*
142.14 *(105.99)*	8759 *(38.96)*	6.09 *(9.79)*	2200	4.22	9th (4H) Gear			199 *(92.5)*	62 *(16.7)*	70 *(21.1)*	29.00 *(97.93)*
144.01 *(107.39)*	7609 *(33.84)*	7.10 *(11.42)*	2199	3.64	10th (5H) Gear			198 *(91.9)*	62 *(16.7)*	72 *(22.2)*	29.00 *(97.93)*
143.70 *(107.15)*	6278 *(27.93)*	8.58 *(13.81)*	2199	2.88	11th (6L) Gear			200 *(93.1)*	62 *(16.7)*	74 *(23.3)*	29.00 *(97.93)*

Department of Agricultural Engineering

Dates of Test: September 12 - 24, 1984

Manufacturer: FORD MOTOR COMPANY, 2500 Maple Road, Troy, Michigan 48084

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.8 (rating taken from oil company's inspection data) **Specific gravity converted to 60/60°F *(15/15°C)*** 0.8378 **Fuel weight** 6.976 lbs/gal *(0.836 kg/l)* **Oil SAE** 30 **API service classification** SE, SF, CC, CD **To motor** 4.063 gal *(15.379 l)* **Drained from motor** 3.700 gal *(14.007 l)* **Transmission and final drive lubricant** Ford 134 fluid **Total time engine was operated** 38.0 hours.

ENGINE: Make Ford Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** *M766277* **Crankshaft** lengthwise **Rated rpm** 2200 **Bore and stroke** 4.4″ × 4.4″ *(112 mm × 112 mm)* **Compression ratio** 15.6 to 1 **Displacement** 401 cu in *(6572 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and sediment bowl **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan.

CHASSIS: Type front wheel assist with duals **Serial No.** *C724968* **Tread width** rear 64″ *(1626 mm)* to 120″ *(3048 mm)* front 70″ *(1778 mm)* to 84″ *(2134 mm)* **Wheel base** 111″ *(2819 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 35.8″ *(910 mm)* Vertical distance above roadway 43.6″ *(1107 mm)* Horizontal distance from center of rear wheel tread 0.2″ *(5 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.8 *(2.9)* second 2.4 *(3.8)* third 2.8 *(4.5)* fourth 3.5 *(5.7)* fifth 3.6 *(5.8)* sixth 4.6 *(7.4)* seventh 4.7 *(7.6)* eighth 5.5 *(8.8)* ninth 6.1 *(9.8)* tenth 7.1 *(11.4)* eleventh 8.5 *(13.7)* twelfth 10.7 *(17.2)* thirteenth 10.9 *(17.5)* fourteenth 13.7 *(22.1)* fifteenth 14.3 *(22.9)* sixteenth 18.3 *(29.5)* reverse 2.0 *(3.2)*, 2.5 *(4.1)*, 5.9 *(9.5)*, 7.6 *(12.3)* **Clutch** single dry disc operated by foot pedal **Brakes** power assisted, double wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 198″ *(5.03 m)* left 198″ *(5.03 m)* (on concrete surface without brake) right 227″ *(5.77 m)* left 227″ *(5.77 m)* **Turning space diameter** (on concrete surface with brake applied) right 414″ *(10.51 m)* left 414″ *(10.51 m)* (on concrete surface without brake) right 472″ *(12.00 m)* left 472″ *(12.00 m)* **Power take-off** 1000 rpm at 1919 engine rpm **Unladen tractor mass** 15100 lb *(6849 kg)*.

LUGGING ABILITY IN 8th (5L) GEAR

Crankshaft Speed rpm	2199	1984	1754	1538	1315	1092
Pull—lbs *(kN)*	10166 *(45.22)*	10870 *(48.35)*	11555 *(51.40)*	11607 *(51.63)*	10608 *(47.19)*	9131 *(40.62)*
Increase in Pull %	0	7	14	14	4	−10
Power—Hp *(kW)*	147.55 *(110.02)*	141.54 *(105.55)*	132.51 *(98.81)*	116.59 *(86.94)*	91.76 *(68.42)*	66.14 *(49.32)*
Speed—Mph *(km/h)*	5.44 *(8.76)*	4.88 *(7.86)*	4.30 *(6.92)*	3.77 *(6.06)*	3.24 *(5.22)*	2.72 *(4.37)*
Slip %	5.04	5.52	5.84	6.00	5.36	4.38

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
Maximum Available Power—Two Hours	82.0	81.5
75% of Pull at Maximum Power—Ten Hours	81.5	
50% of Pull at Maximum Power—Two Hours	81.5	
50% of Pull at Reduced Engine Speed—Two Hours	79.0	
Bystander in 16th (8H) gear		88.5

DRAWBAR PERFORMANCE
(Front Wheel Drive Disengaged)

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 8th (5L) Gear											
140.64 *(104.88)*	10079 *(44.83)*	5.23 *(8.42)*	2200	8.23	10.128 *(38.337)*	0.502 *(0.306)*	13.89 *(2.736)*	206 *(96.4)*	63 *(17.2)*	78 *(25.3)*	28.85 *(97.42)*
MAXIMUM POWER IN SELECTED GEARS											
125.15 *(93.33)*	13887 *(61.77)*	3.38 *(5.44)*	2314	14.81	5th (2H) Gear			195 *(90.3)*	58 *(14.4)*	65 *(18.3)*	28.83 *(97.35)*
143.24 *(106.81)*	10189 *(45.32)*	5.27 *(8.48)*	2199	7.62	8th (5L) Gear			203 *(94.7)*	63 *(17.2)*	75 *(23.9)*	29.00 *(97.93)*

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8-38; 10; 16 *(110)*	Four 20.8-38; 10; 16 *(110)*
Ballast	—Liquid (each inner)	375 lb *(170 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 16.9-28; 6; 18 *(125)*	Two 16.9-28; 6; 18 *(125)*
Ballast	—Liquid (each)	440 lb *(200 kg)*	None
	—Cast Iron (each)	750 lb *(340 kg)*	None
Height of Drawbar		24.5 in *(620 mm)*	24.5 in *(620 mm)*
Static Weight with Operator—Rear		12400 lb *(5625 kg)*	11650 lb *(5285 kg)*
—Front		7870 lb *(3570 kg)*	5490 lb *(2490 kg)*
—Total		20270 lb *(9195 kg)*	17140 lb *(7775 kg)*

THREE POINT HITCH PERFORMANCE

Observed Maximum Pressure psi *(kpa)*	2550	*17580*
Location	remote	
Hydraulic oil temperature °F *(°C)*	104	*40*
Location	sump	

	Maximum Lift Capacity		Lift Capacity for Transport
QUICK ATTACH	no		
CATEGORY	II		*not measured
LOAD lbs *(kg)*	7158	*3247*	
TIME sec	2.04		
HITCH POINT MOVEMENT in *(mm)*			
Lowest position	9.1	*232*	
Top of timed range	33.1	*841*	
Highest position	36.6	*930*	
LOAD CG MOVEMENT in *(mm)*			
Lowest position	9.3	*235*	
Top of timed range	32.8	*832*	
Highest position	36.6	*930*	

*Implement load capacity for transport purposes not specified by manufacturer.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes and the technically equivalent ISO test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 183°F *(84.0°C)*. Nine gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1537,** November 26,1984.

NOTE: Report reissued, supplemental sales permit for Ford 8830 Diesel 16 speed, July, 1990.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
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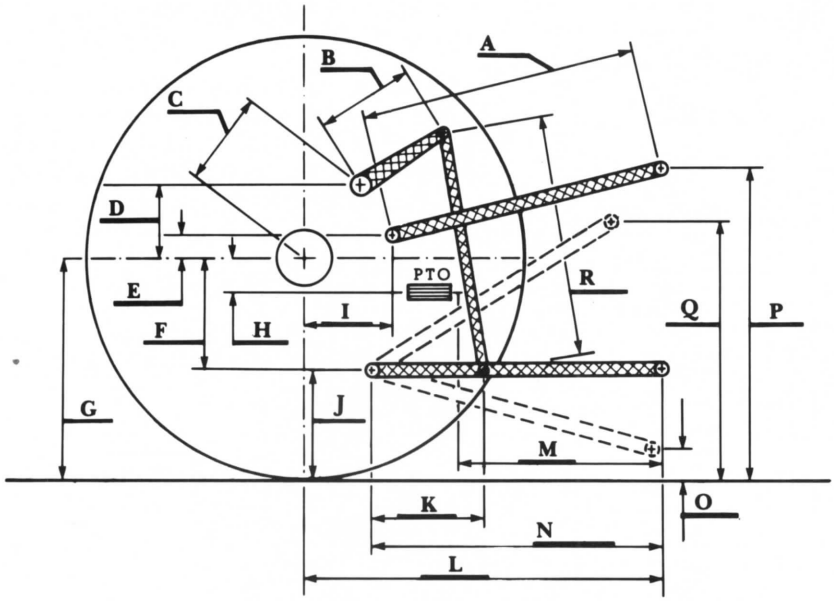

Hitch Dimensions as Tested — No Load

	inch	*mm*
A	28.9	*734*
B	15.0	*381*
C	16.2	*412*
D	15.5	*394*
E	8.0	*203*
F	10.5	*267*
G	33.9	*861*
H	2.4	*62*
I	17.0	*432*
J	23.4	*594*
K	18.9	*481*
L	45.3	*1150*
M	23.6	*600*
N	36.3	*921*
O	8.0	*203*
P	42.4	*1077*
Q	37.0	*940*
R	33.1	*841*

Ford TW-35 Diesel

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